



State of **EMPIRE**

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Recent development

- Six ejectiles (n, p, alpha, g, d, t, ^3He) + arbitrary light ion; includes ENDF-6 formatting (Capote, Trkov)
- Inclusion of RIPL-3 combinatorial level densities with parity dependence
- Further extension of the resonance module
 - adjustment of capture, elastic and fission uncertainties to reproduce thermal uncertainties using anticorrelations
 - inclusion of arbitrary correlations among gamma-widths and among neutron-widths
- Upgrade of ZVView package - 2-D and 3-D plotting of covariance matrices (Zerkin)
- Working towards EMPIRE-3.0 release

Resonance module (scat. radius uncertainty) (Young-Sik Cho)

File Input Outputs Help

Input Execute

ZA: MAT:

s-wave **p-wave** **d-wave**

SF:

Gg:

D : spin cut-off :

Resolved region

E_{max} : R' :

G_{n0}_cut: G_{n1}_cut:

Unresolved region

a l.d.p. : gPower :

E_{max} : energies:

- Energy dependent D and neutron width for s-wave
- Energy dependent D and gamma width for p-wave
- Energy dependent D and gamma width for d-wave

Resonance module (parameter correlations)

(Young-Sik Cho)

File Input Outputs Help

Input Execute

Evaluation

All codes
 PTANAL
 WRIURR
 RECENT/
SIGMA

Run codes

Analysis

Cumulative plot
Porter-Thomas analysis

ENDF

Comparison

ENDF/B-VII JENDL-3.3 JEFF-3.1

Total Scattering Capture

Uncertainty calc.

No. of resonances to be varied: 10 All codes Run codes

No. of additional resonances held fixed: 5 Sensitivity

No. of resonances to write out: 3 KALMAN Parameter unc.

Reaction to be considered in KALMAN: None 1 2 18 102 All

Correlations of GnGn: 0.0 GgGg: 0.0 No. of res.: 9999 Save cov.

Working towards EMPIRE-3.0 release (C. Mattoon)

- Scripts modified to allow running EMPIRE in an arbitrary directory - step towards parallelization
- Simplified installation (modernized Makefile)
- More user friendly GUI
- several Bash scripts ported to Python (error checking)
- Python modules for manipulation of ENDF files
 - functions for reading/writing ENDF sections (search & replace)
 - classes for dealing with MF=31, 32, 33, and 35
 - classes for working with multi-group cross sections and covariances from NJOY and PUFF

$^{55}\text{Mn}(n,\text{inl})$

In theory we trust!

Cross sections

